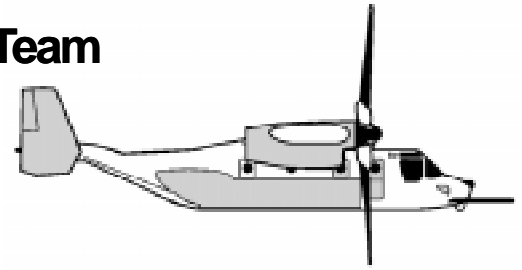


OSPREY FACTS



V-22 Osprey takes to skies over Hurlburt

By Joan Prichard
Air Force Special Operations Command Public Affairs

HURLBURT FIELD, Fla. (Nov. 17, 1999) — The V-22 Osprey recently flew overhead here during an orientation flight for Lt. Gen. Clay Bailey, commander of Air Force Special Operations Command. The Osprey is here for two weeks to undergo a critical operational evaluation that will determine its readiness to join the fleet. Following the orientation flight, the general said the tiltrotor aircraft's most impressive quality is its ability to get airmen in and out of an area quickly. "I was very impressed with its performance," said the general. "During the flight they demonstrated going as fast as you can from airplane mode to helicopter and from helicopter to airplane mode. So from an employment

standpoint you could still be going 250 knots in an airplane configuration 2 miles from

the landing zone and rapidly convert to a helicopter, set it down, and 18 seconds later go at 250 knots again." The V-22's OPEVAL began this month and will continue through the spring of 2000 with tests scheduled at Marine Corps air stations in North Carolina and Arizona, Naval Air Warfare Center Weapons Division, China Lake, Calif, and air-capable ships located on each coast. The Multi-Service Operational Test Team responsible for the testing is comprised of Air Force and Marine Corps pilots, aircrew, maintenance personnel, operations analysts and flight engineers. During its test period at Hurlburt Field, the team will evaluate the Osprey's interoperability with Special Operations Forces and its compatibility with airfield assets, resources and special equipment.



Successful sea trials concluded on Saipan, Tortuga

By Gidge Dady
Naval Air Systems Command Public Affairs

NAVAL AIR STATION PATUXENT RIVER, Md. — The V-22 government and industry Integrated Test Team has just concluded successful sea trials for the engineering and manufacturing development MV-22 aircraft aboard two amphibious ships, the USS Saipan and the USS Tortuga.

"The Navy team brought this success to the V-22," said Col. Nolan Schmidt, V-22 program manager. "Integration occurred between the engineering competency, the integrated test team, program management, and Bell-Boeing, all giving 110 percent to solve the aircraft's lateral stability issue raised in the January sea trials. Other key members were the Saipan and Tortuga crews and command elements that provided the flexibility to allow these sea trials to be added to their busy schedules."

During the January-February sea trials pe-

riod which was conducted aboard the LHA class ship, USS Saipan, the MV-22 completed over 350 landings and tests to determine its suitability for operations aboard large deck amphibious ships, as well as all of its required maintenance and non-flying tests. The MV-22 returned to sea in August and September to complete additional shipboard testing which included expanding the launch and recovery envelope for various port and starboard landing spots on both ships, and to validate the improvements in the automatic flight control system.

While on the USS Saipan, the pilots established parameters for wind conditions for six helicopter landing spots, executed 260 day and night vertical launches and 269 recoveries over these landing spots, and performed nine short take-offs. As part of the external loads requirements, the MV-22 lifted a 4,000 lb. netted load on a single point hook and, for the first time aboard

ship, a 6,300 lb. High Mobility Multi-Wheeled Vehicle on a dual point hook.

Accomplishments aboard the LSD class ship, USS Tortuga, also included building the wind envelope for two landing spots and completing over 75 day and night launches and recoveries on these spots. Now that the wind tolerances for safely launching and landing the MV-22 on the ship's helicopters spots have been defined, the Osprey can fly on and off any of the LHA/LHD/LSD/LPD amphibious class ships. "This was one of our primary objectives in returning to sea the second time and, now that we have established the launch and recovery envelope, the MV-22 is ready to move into Operational Evaluation," said Lt. Col. John Rudzis, V-22 government flight test director.

The other portion of testing that was evaluated during the recent sea trials was improvement in the flight control system software.

MOTT: Operational Evaluation under way for production model MV-22s

By Gidge Dady
NAVAIR Public Affairs

NAVAL AIR STATION PATUXENT RIVER, Md. (Nov. 2, 1999) – Its revolutionary technology has placed the MV-22 Osprey in a class by itself. Now in initial production, the tiltrotor aircraft, which has undergone extensive testing here, has entered a critical test period that will evaluate its suitability and effectiveness for operational use. While the verdict is still out about the grade the Osprey will receive after its “final exam,” officials in the V-22 program office believe that if it performs as well during Operational Evaluation as it did during Engineering and Manufacturing Development, it should pass with flying colors.

The MV-22's OP-EVAL began this month and through the spring of 2000, the Multi-Service Operational Test Team, comprised of Marine and Air Force pilots, aircrew, maintenance personnel, operations analysts and flight engineers, will be evaluating the MV-22's readiness to join the fleet. This squadron of independent testers will use the first four low rate initial production aircraft for about 700 flight hours during 350 sorties to conduct extensive operationally representative missions from air capable ships, airfields, remote sites, confined areas and major range and test facilities.

The locations that will host the V-22 OP-EVAL include the Marine Corps Air Stations in North Carolina and Arizona, Air Force Special Operations Command at Hurlburt Field, Florida, Naval Air Warfare Center Weapons Division, China Lake, California, and air capable ships located on each coast. According to Lt. Col. Jim Shaffer, deputy director for the MOTT, these sites were chosen because they have diverse climates, altitudes, and have supporting assets that will allow the MOTT to evaluate how the MV-22 inter-operates with other platforms to include the CH-46, CH-53, the F-18, AV-8, and Marine and Air Force tankers.

The MOTT will begin conducting one of its most intensive evaluation periods in November at MCAS New River, NC. During this phase, the MOTT will conduct land and shipboard operations to include launching mock amphibious assault missions with Marines moving from ship to shore. Part of this will include over-water operations, night vision goggle tests, low level navigation, external loads lifting on single and dual hooks, and inflight refueling with a C-130 tanker.

Early next year, the MOTT will conduct survivability tests on the range at China Lake and continue with additional shipboard testing. Other tests will include fast roping, hoist operations, and flying multi-aircraft forma-



Mission-oriented evaluations go further during Operational Evaluations than during Operational Testing (OT-IID). Op-eval continues until May 2000.

tions from ship to land to evaluate the effectiveness of the troop assault mission.

While this evaluation is for the Marine MV-22, portions of the Special Operations Force mission will be assessed. Since the CV-22 Air Force variant, although not yet in production, is 90 percent common with the MV-22, the MOTT will use this evaluation period to assess areas that are specific to the SOF. They will use Hurlburt Field to test the Osprey's interoperability with special operations personnel and its compatibility with airfield assets, resources and special equipment.

“At each of these sites, the Osprey will be evaluated on many levels. People tend

to place emphasis on what the pilots think about how the aircraft handles and performs its mission, but we also have to evaluate how reliable and maintainable it is, how often it need repairs and how long the repairs take,” said Shaffer.

The Osprey's performance will be graded against established requirements for this evaluation period. Each time a pilot conducts a flight or a maintainer makes a repair; for example, they must grade the mission or task. This is done via the V-22 Questionnaire Tool, a computer based program that will be used to collect a wide spectrum of operational data. This tool was designed to produce different types of questionnaires that are tailored to specific events accord-

ing to Capt. Mac Blythe, a MOTT operations analyst who helped design the VQT. “The pilots and enlisted crew members will answer questions about how effective the V-22 was in performing a particular event. Likewise, maintainers will evaluate maintenance actions they complete. In addition to these questionnaires, evaluators periodically have to answer more in-depth questions about human factors, safety, training and operational and maintenance issues,” said Blythe.

While the data collected through the VQT is more subjective, Blythe said they would be able to capture objective data through avionics data bus recorders and visual/audio recording packages onboard the aircraft. These three sources will provide the primary means of measuring the Osprey's performance.

After OP-EVAL is completed and the data is gathered, the MOTT will prepare a report with an evaluation of the MV-22's suitability and effectiveness for operational use. The Commander, Operational Test and Evaluation Force and the Commander, Air Force Operational Test and Evaluation Center will review the report and make a decision about whether the MV-22 successfully completed OP-EVAL. Successful completion is required to support the full rate production decision scheduled for FY-01. Plans call for the Marine Corps to purchase 360 MV-22s; the Air Force to buy 50 CV-22s.

U.S. Army: Time for the V-22?

By Loren B. Thompson
Reprinted from Army Magazine

When the U.S. Army and the U.S. Air Force became separate services after World War II, one of the most contentious issues was defining a clear postwar identity for Army aviation. Although the institutional separation was authorized by the National Security Act in 1947 and the services agreed to a formal enumeration of their respective functions in the 1948 Key West Agreement, 10 years later the Department of Defense was still revisiting aviation in an attempt to clarify the Army's role.

The general thrust of departmental policy was to assign almost all missions for which fixed-wing aircraft were best suited to the Air Force and encourage Army aviators to rely on rotary-wing systems to accomplish the remaining missions. In 1957, Defense Secretary Charles E. Wilson directed that no Army fixed-wing aircraft could exceed an empty weight of 5,000 pounds, but its helicopters could weigh up to 10 tons. Not surprisingly, Army aviation came to consist almost entirely of rotary-wing assets, a trend confirmed by the operational demands of the Vietnam War. By the late 1970s the Army had accumulated an inventory of 8,000 helicopters, the biggest and most capable such force ever assembled.

Helicopters revolutionized land warfare, and they continue to shape strategy and tactics today. But like fixed-wing aircraft, rotary-wing systems have certain intrinsic performance limitations that greatly constrain Army operations. The service seldom notices these constraints because it has grown so accustomed to operating within them. When a mission requires flight performance beyond the reach of helicopter technology, the Army calls on the Air Force for support. It is a division of labor that works reasonably well as long as the Air Force is not overwhelmed by competing priorities in the war zone.

Even before the Vietnam conflict confirmed the Army's reliance on this way of fighting wars, a third type of aircraft had begun to emerge that overcame the limitations of both rotary-wing and fixed-wing aircraft. It was the tiltrotor, an aircraft designed to combine the vertical maneuverability and hover capability

of a helicopter with the long range, high speed and endurance of an airplane. This versatility is achieved by placing oversized propellers (prop-rotors) and their engines at the tips of wings, which enables the propellers to pivot from vertical to horizontal position while in



The Army's Highly Mobile Multi-wheeled Vehicle (Humvee) was carried during external loads testing in 1999.

flight. The tiltrotor thus can ascend straight up like a helicopter and then convert to cruising like a conventional turboprop. Unlike a turboprop, it can land almost anywhere, and its speed and range are typically expressed as multiples of helicopter performance.

Prototype tiltrotors were developed by Bell and Boeing in the 1950s, and they demonstrated their unique features in flight before the end of the Eisenhower administration. Two generations of more advanced tiltrotors followed, and the Army was present at the creation of both. The first was the NASA/Army XV-15 program begun in 1973, which had its initial flights during the Carter administration. The second was the joint services advanced vertical lift aircraft (JVX), which began as an Army-led program in 1982. The latter program is now coming to fruition as the V-22 Osprey, an aircraft that in various versions will be operated by the U.S. Marine Corps, Navy and Air Force.

Although the Army was present at the creation of this versatile military system, it is not present at the fruition. In 1983 the Navy took over program leadership, and in 1988 the Army withdrew entirely, ostensibly to pursue the LHX program. The LHX became the RAH-66 Comanche, which one day soon promises to be the most sophisticated combat helicopter

in the world. But an armed reconnaissance helicopter does not have much mission overlap with a transport aircraft like the V-22, and many Army aviators in 1988 expressed a desire to revisit the JVX effort once development was completed. (A transport variant of the LHX was canceled the same year.) Now the V-22 is in production, and the Army is missing in action.

The short answer for its absence is money. The Army's aviation modernization budget is so under-funded that even suggesting the introduction of another high-tech airframe may seem pointless. Moreover, the V-22 cannot carry internally a Humvee, diminishing its appeal to the service. But maybe money and internal cargo capacity are not the only reasons for the Osprey's absence from Army plans. Perhaps the omission also reveals a lack of imagination within Army aviation caused by too much conventional thinking and cultural insularity. Maybe it indicates the intellectual rigidity that can result from being in a state of chronic fiscal crisis. It also may reflect an unacknowledged disconnect between Army plans and emerging operational challenges. Before dismissing such possibilities, consider some recent news items of interest to Army aviation.

See Page 4

continued from page 1

Sea Trials complete

This improvement, which corrected the lateral stability problem, were tested here at the Manned Flight Simulator as well as the Boeing shipboard simulator before testing them at sea. "Shipboard tests also validated the upgraded software which now enables the aircraft to respond more quickly and predictably to pilot inputs during take off and landings," said Rudzis.

Now that the EMD sea trials are completed, the next milestone is operational evaluation, the final report card for the MV-22. During this seven-month evaluation, beginning in October, the MV-22 will receive a grade on whether it is operationally suitable and effective for fleet introduction. The aircraft used in the EMD sea trials were the test birds; however, the aircraft that will be operationally evaluated are the first lot of low rate initial production MV-22s. A favorable recommendation will support the full rate production decision.

Army: Time for the V-22? (Cont.)

* Shortly before becoming the Army's new Vice Chief of Staff, Gen. John M. Keane criticized the service's prevailing approach for introducing forces into conventional conflicts as an anachronism and asserted that the service needed to rely more heavily on vertical assets not directly under its control. Reflecting on operations in Kosovo, Gen. Keane decided the limited role of aircraft in current plans and argued that greater use of other services' airborne systems could prove essential to future operational success.

*The increasing frequency of extended-range helicopter missions is forcing the Army to develop a new external fuel tank for its Apache and Black Hawk helicopters.

Long-range missions in hostile airspace used to be so uncommon that little thought was given to the crashworthiness or ballistic vulnerability of auxiliary tanks, but mission profiles are changing and a better tank is needed.

* At a May conference of the Army Aviation Association of America, Lt. Gen. Johnny M. Riggs asserted that the service aviation community needed to completely rethink its assumptions about how to participate in joint warfighting. According to *Inside the Army*, Gen. Riggs told his audience they should ask themselves if we are "packaged right at the tactical level for joint or combined operations."

* During their review of the fiscal year 2000 defense budget in the spring, Senate authorizers condemned the Army's latest aviation modernization plan as ill conceived and un dependable. Their complaints reportedly paralleled the concerns of former Chief of Staff Gen. Dennis J. Reimer, who was said to describe the utility helicopter portion of the plan as "the fourth story in four years."...

...It is ironic that the Army, which presents itself as the "versatile force" in Army *Vision 2010*, is the only service not planning to purchase this extremely adaptable airframe.

One reason, obviously, is the service's huge

investment in its existing helicopter fleet. The Army cannot afford to simply walk away from thousands of utility helicopters, no matter what their limitations may be. But consider the words of Lt. Gen. Fred McCorkle, deputy chief of staff for aviation at the Marine Corps' headquarters: "I have a lot of flying time in the Black Hawk, and it is the finest helicopter that I've ever flown, [...but] I wouldn't buy a single one for the Marine Corps because the Marines want to fill them up with a lot of stuff." Gen. McCorkle argues that the V-22 is so superior to the UH-60 that it would make operational sense to trade one Osprey for two or three Black Hawks. When the lower support costs of the V-22 and the reduced unit costs result-



The V-22 cockpit has been modified to receive flat panel multi-function display technology, saving \$500 million in procurement costs. (Dave Martin photo)

ing from a bigger joint-service buy are added in, he says, the budget impact looks more like a bargain than a burden.

This article does not attempt to make a budgetary case for the V-22 but to assert that the Army needs to recognize the V-22 for what it is: a revolutionary aircraft that will transform the way in which land warfare is conducted. The Army cannot afford to be left out of that transformation. Whatever the budgetary, bureaucratic or doctrinal dislocations that may result, the Army needs to have the Osprey. Having the Osprey begins with admitting that the requirement exists.

Loren B. Thompson, Ph.D., is the chief operating officer of the Lexington Institute and teaches in the National Security Studies Program at Georgetown University.

V-22 EMD Flight Test Status as of November 22, 1999

A/C #	Total EMD Hours	Total EMD Flights
7	367	177
8	457	258
9	318	140
10	358	153
Totals	1,500	728

Total V-22 Flight Time	2,682 hrs
Maximum Airspeed Attained	342 kt
Maximum Altitude Attained	25,000 ft
Max Take-Off Gross Weight	60,500 lb
Maximum Load Factor	3.9 Gs

V-22 articles published since September 1999

Aerospace Daily, Sept. 20, 1999: National Guard V-22

Army Magazine, Nov. 1999: Army XXI Aviation: Time For The V-22? by Loren B. Thompson

Aviation International News, Oct. 1999: Pentagon goes full tilt for Bell Boeing V-22

Daily Mall (Pentagon), Sept. 10, 1999: The Winged Wonder -- On a mission to revolutionize warfare, the helicopter that transforms into a plane

Flight International, Oct. 13, 1999: RN/RAF support helicopter programmes merge

Jane's Defence Weekly, Oct. 13, 1999: Operational Evaluation under way on MV-22, by Craig Hoyle & Greg Seigle

Portsmouth News (UK), Sept. 19, 1999: Super-copters [Merlins] outdated before they enter service, by Adrian Wills

Proceedings, Nov. 1999: How will we Escort the MV-22? (Marine Corps Essay Contest Winner), by Capt. Phillip Tucker

Rotor & Wing, Nov. 1999: The Return of the Army Tiltrotor, by Majors Robert W. Werthman & Carl Simon

Rotor & Wing's Helicopter News, Sept. 10, 1999: Revolutionary Rotorcraft Showcased at Pentagon

Weldon Weekly Report, Sept. 10, 1999: My Inaugural V-22 Flight, by Curt Weldon